CORE Project Definition

HIGH - FSZ

NUMBER OF LANES

Evaluation Criteria – Number of I-15 lane and shoulder miles added or improved, by type and level of improvement.

Edit Facts

Lanes and Shoulders:

- 4 foot shoulder: 0.00 miles
- 6 foot shoulder: 0.32 miles
- 8 foot shoulder: 0.71 miles
- 10 foot shoulder: 0.00 miles
- 12 foot shoulder: 91.86 miles
- Auxiliary Lane: 20.70 miles
- 11 foot GP Lane: 45.32 miles
- 12 foot GP Lane: 147.70 miles
- HOV Lane: 45.32 miles
- 4 foot buffer: 45.32 miles
- <4 foot buffer: 0.00 miles

Lane Miles:

- Shoulder: 91.86 lane miles (12 feet by 1 mile)
- Travel Lanes: 251.52 lane miles (12 feet by 1 mile)

Additional Information

- None

Edit Significant Strengths

- The Proposal provides 259 miles of new or improved mainline lanes (total of Auxiliary, GP and HOV lanes)
- The Proposal provides the Full build-out of the Ultimate Infrastructure Configuration width plus an additional NB auxiliary lane between Orem 1600 N and Pleasant Grove Boulevard. The addition of this auxiliary lane will improve the 2030 Peak Hour level of service from D to C for the 5 NB mainline GP lanes adjacent to this auxiliary lane. Since this section of I-15 acts as a local major arterial, providing this lane will also provide operational benefits to the local network operations.
- The Proposal provides full build-out of the mainline to meet 2030 traffic demand between Provo Center Street and US6 including:
  - Completion of the full extent of the currently planned Express Lane system
  - Providing full width shoulders and full vertical clearance through replacement of the following mainline and overcrossing structures; (no shoulder or vertical clearance deviations required)
    - Replaces bridges at Provo 920S; 600S; Spanish Fork 2700N (over I-15); UPRR; UTA; Spanish Fork Main Street
    - Replaces box culvert at Hobble Creek
  - Eliminating the need for a second phase of construction to provide the I-15 roadway defined under the current FEIS/ROD and 404 permit

Minor Strengths

- The Proposal commits to provide the additional shoulder width required to correct the existing stopping sight distance between American Fork Main Street and Lehi Main Street
- The proposal provides the auxiliary lane between American Fork 300 West and American Fork Main Street
- The proposal adds one I-15 mainline lane and full shoulders in each direction from US6 through the Spanish Fork 300 West structure. This requires the replacement of mainline and overcrossing bridges at Spanish Fork 300 West, Spanish Fork Main Street and the US 6 interchange.
- The proposal provides the pavement width needed to provide the ultimate future lanes from American Fork Main Street through Lehi Main Street. This will simplify the extension of I-15 improvements to the north under the current FEIS/ROD

Minor Weaknesses

Significant Weaknesses

NUMBER OF INTERCHANGES

Evaluation Criteria – Number of interchanges reconstructed or improved and level of improvement.

Edit Facts

Number of Interchanges Reconstructed or Improved:

- Reconstructed: 8
- New: 2 (HOV access only)
- Improved: 6

Reconstructed: (8)

1. Lehi Main
2. AF 500 East
3. 1600 North
4. 800 North
5. Orem Center
6. Provo Center
7. US-6
8. SF Main

Edit Significant Strengths

- Lehi Main Street I/C: the proposal builds-out the I/C a SPUI
- University Parkway I/C & Sandhill Road I/S complex:
  - The four legged intersection of University Parkway and Sandhill Road is consistent with driver expectations.
  - Provides a grade separated direct connection from westbound University Parkway to the northbound I-15 on ramp. This simplifies traffic patterns between the University Parkway interchange and the Sandhill Road I/S
  - Provides a direct connection from

Minor Strengths

- Tight diamonds I/C's at Orem 800 N and Orem Center street maximize the distance between ramp terminals and adjacent I/S's
- Orem 400N Express Lane Direct Access I/C and Orem 1400S Express Lane Direct Access I/C and Park & Ride with access to Sandhill Road
  - Facilitates movements from the local road system to the Express Lane system for transit, HOV and ETC users
  - Increases life of nearby I/C's (notably Orem 800N, Center Street, and University Parkway)
- Provo Center Street I/C:

Minor Weaknesses

- University Parkway I/C and Sandhill Road I/S complex:
  - One movement, the NB off ramp to westbound University Parkway is not consistent with driver expectancies (at the DDI);
  - Signing, sight distance and merge area concerns for I-15 SB to College Drive and I-15 NB to College Drive direct connection

Significant Weaknesses

New: (2)

1. HOV DC to ~ 1500 South (Park and Ride Lot)
2. HOV DC to 400 North

Improved: (6)

1. AF Main
2. PG Blvd
3. University Parkway
4. University Ave
5. North Springville
6. South Springville

SEE ATTACHED PDF FOR MORE INFORMATION (related to above)

Additional Information:

- I-15 NB (right coordinated with SPUI signal) and from I-15 SB (through SPUI signal) to College Drive via a tunnel. This simplifies the traffic movements on University Parkway.
- Provo Center Street I/C:
  - Simple, consistent with driver expectancies
  - Simple direct access from Draper Lane to Provo Center Street, no other local streets involved
  - Coordinated signals will allow essentially free flow for major movements; and allows coordination with local system traffic
- US6 I/C:
  - Reconstructed
  - Direct ramp movement from I-15 NB to US6 EB (braided ramp with Spanish Fork Main Street on-ramp to I-15 NB)
  - Additional lanes and ramp length from WB US6 to NB I-15
- Spanish Fork Main Street I/C: Reconstructed
  - Access to and from Draper Lane is shortened and is consistent with driver expectancies.
- US6 I/C: Free flow movement from SB I-15 to EB US6
- Spanish Fork Main Street I/C: On-ramp to I-15 NB provides more vehicle storage due to separate lanes to recieve traffic from SB and NB Main Street.
  movement
- Provo Center Street I/C:
  - Access control is less than required due to proximity of Provo Center Street ramp terminal to I-15 NB / Draper Lane access I/S
  - Provo Center Street through movements must move left one lane and negotiate two right angle, signalized I/S
- FSZ must secure environmental approvals and permits for new Express Lane direct access I/C's.

OPERATIONAL METRICS OF MAINLINE

Evaluation Criteria – Operational metrics of mainline, at and between interchanges.

Edit Facts

For all 50 segments:

AM Peak
LOS C or better, 42 segments
LOS D, 8 segments
LOS E/F, 0 segments

PM Peak
LOS C or better, 33 segments
LOS D, 17 segments
LOS E/F, 0 segments

For the 18 segments on which differences exist in number of lanes among the three proposals:
AM Peak
LOS C or better, 13 segments
LOS D, 5 segments
LOS E/F, 0 segments

PM Peak
LOS C or better, 12 segments
LOS D, 6 segments
LOS E/F, 0 segments

Within the UIC

Northbound

Auxiliary lane between 1600 North and PG Blvd --LOS C

Southbound

Transition at the northern terminus --LOS D

Edit Significant Strengths

1. Proposer provided 2030 LOS D or better for full build out of UIC.
2. Proposer provided 2030 LOS D or better outside the UIC, south to Spanish Fork.

Minor Strengths

- Express Lane Direct accesses will reduce the amount of weaving to and from the inside Express Lanes to the outside ramps.
- 42 segments out of 50, LOS C or better in AM peak.
  33 segments our of 50, LOS C or better in PM peak.
  Auxiliary lane between 1600 N and PG - LOS C.
  Auxiliary lane between Orem Center and University Parkway - LOS C.
  Between ramps and US6 interchange - LOS B.
  Between and SR77 - LOS C.
  Betwewn ramps and SR75 - LOS C.

Minor Weaknesses

Significant Weaknesses

Auxiliary lane between Orem Center and University Parkway --LOS C

South of the UIC

Northbound

Between ramps at US-6 interchange --LOS B

Between ramps at SR-77 --LOS C

Between ramps at University Avenue --LOS D

Southbound

Between ramps at SR-75 --LOS C

South of the US-6 Exit
LOS D until the terminus where it's LOS C

Transition Travel times

2030 Southern Terminus from SR-77 to South of 300 West
3.27 minutes

2020 Northern Terminus from 100 West SF to 300 N Lehi
2.70 minutes

OPERATIONAL METRICS OF TRANSITIONS

Evaluation Criteria – Operational metrics of mainline transitions to existing facilities.

Edit Facts

- LNS 1 the east end of 2700 North ends 400 feet west of 1750 N. Howewver the Proposal only builds a 2 lane road for 2700 North
- LL 01 4th SB GP lane is developed across a reconstructed/wider Lehi Main St bridge.
- LNS At Lehi Main street the SB lane additions appear to be smooth and logical. One lane is added in a smooth transition between the on and off ramp gores and one lane is added at the on ramp.

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Traffic Group Input:

1. Lehi Main Street - Reconstructed SPUI interchange
    1. 2020 AM LOS
        1. Intersection = C
    2. 2020 PM LOS
        1. Intersection = C
        2. Mainline
            1. Northbound = C & D
            2. Soutbound - the basic section over the Lehi Structure = D
2. US-6 South Terminus - Spanish Fork
    1. 2020 AM LOS
        1. Mainline
            1. Northbound = C
            2. Southbound = A
    2. 2020 PM LOS
        1. Mainline
            1. Northbound = B
            2. Southbound = C & D

Edit Significant Strengths Minor Strengths

- Northern terminus contains logical and smooth lane transitions
    - Lehi Main Street I/C improvements for 2030 traffic demands will allow mainline transitions to function longer
    - Maintains full utilization of UIC width through the AF Main Street I/C
    - NB lanes are dropped at ramps
    - Mainline LOS C in AM and PM
- Southern Terminus contains logical and smooth lane transitions
    - US6 I/C improvements for 2030 traffic demands will allow mainline transtions to function longer
    - SB lanes are dropped at ramps
    - Mainline LOS C Northbound AM and PM. Mainline LOS A Southbound AM, LOS B Southbound PM.

Minor Weaknesses Significant Weaknesses

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REGIONAL MOBILITY - TDM

Evaluation Criteria

Level of improvement to regional mobility associated with mainline improvements using the results from the TDM, as listed below:

- VMT
- VHT
- Average speed
- Total delay
- User costs
- Percent VMT with V/C greater than or equal to 1 (for all links excluding centroid connectors)

Edit Facts

MOE's Reported by FSZ

AM Period

Measure	FSZ Build	No Build	Change	%Change
Percent VMT with V/C >= 1	8.8%	11.3%	-2.5%	-22.1%
VMT	2,720,821	2,677,268	43,553	1.6%
VHT	73,097	76,851	-3,754	-4.9%
Speed (mph)	37.2	34.8	2.4	6.9%
Delay (Hr)	16,870	20,462	-3,592	-17.6%

PM Period

Measure	FSZ Build	No Build	Change	%Change
Percent VMT with V/C >= 1	8.0%	21.0%	-13.0%	-61.9%
VMT	3,709,415	3,606,679	102,736	2.8%
VHT	100,211	112,090	-11,879	-10.6%
Speed (mph)	37.0	32.2	4.8	14.9%
Delay (Hr)	20,614	32,273	-11,659	-36.1%

Note: These MOE's were able to be re-created by the evaluation team. Therefore, no modifications were made to the base WFRC/MAG model. Only changes to the master network file needed to be verified.

Discrepancies Between Master Network and Instructions

1. The number of lanes on I-15 were changed from 2 to 3 for a short portion south of Spanish Fork 400 N. This was not in their design and was not allowed by the Instructions.

Discrepancies Between Master Network and Design Files

1. Provo Center Street – SB On-Ramp is 568 ft in the model while in the design it is 1500 ft.
2. Provo Center Street – NB On-ramp is coded as 3 lanes in the model for 2162 ft while the design shows 3 lanes for 700 ft and then changing to 2 lanes for the remaining 1200 ft (medium volume area).
3. Provo Center Street – NB On-Ramp has a iong single auxiliary lane (1500 ft) in the design that is not in the model.
4. University Parkway SB On-Ramp is coded as 3 lanes in the model and the design shows a transition to 2 lanes before merging with I-15 (medium volume ramp). The NB On-Ramp is coded as 4 lanes in the model and the design shows a transition to 3 lanes before merging with I-15 (high volume ramp).
5. Orem 1600 North and 800 North – Both On-Ramps are coded as 3 lanes in the model for the entire length while the design sheets show them as 3 lanes for a portion, but then reducing to 2 lanes before entering the freeway (medium volume ramps).
6. Orem Center Street NB On-Ramp is coded as 3 lanes in the model. The design shows a transition to 2 lanes before merging with I-15 (high volume ramp).
7. 400 North is shown as 2-lanes each direction at I-15 crossing in the design and the model has only 1 lane each direction (med-low volume area).

Impact of Discrepancies

Edit Significant Strengths

1. The ultimate 2030 facility significantly improves regional traffic condition variables over the No Build condition, particularly in the PM peak period, the heaviest of the two peak periods.

Minor Strengths

1. The combination of improvements committed by this proposer in the Orem area result in an improvement of conditions on Geneva Road.
2. The HOV direct connectors committed to by this proposer at 400N result in an attraction of traffic which improves operations at other nearby interchanges.
3. American Fork to Pleasant Grove, 85% of movements operate at LOS C.

Minor Weaknesses

Significant Weaknesses

The net impact of discrepancies from the Instructions and the Design Files is **slightly negative to the MOE's** reported (i.e. the reported values are better than they would be if the discrepancies were correctd). However, with the exception of the Percent VMT with V/C >=1, all **MOE's are within 1% of the reported value**. The attached spreadsheet provides details.

Regional Impact of HOV Interchanges

A test was performed to evaluate the regional mobility benefits of the HOV interchanges. The southern HOV interchange appears to provide no benefit during the AM and only a small benefit in the PM. The 400 North HOV interchange appears to have a minor benefit for both AM and PM. The attached spreadsheet provides details.

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LAP

[From required regional mobility narrative, general]:

1. Highly experienced team.
2. Industry standard approaches coupled with requirements.
3. Extensive calibration including base saturation flow adjustments.

[From required regional mobility narrative, mainline]:

1. Conducted 2020 transition and 2030 mainline analysis.
2. Conducted post-2030 mainline analysis.
3. 70% of AM/PM segments operate LOS C or better.
4. Average freeway segment will provide LOS D until 2041.
5. Final design provides a reduction of traffic delays by 36 percent for drivers.
6. Total VMT increases slightly, travel time reduced (5-11%), network speeds increased (7-15%), and delay reduced (18-36%).
7. America Fork to American Fork 500 and Pleasant Grove: 85% of the movements operate at LOS C. Freeway mainline speeds 62-63 mph, travel time 4% higher than free flow.
8. Express lane direct connect ramps eliminate mainline weave issues.
9. Through Provo interchanges (Provo Center and University Avenue): All mainline segment operate at LOS D or better.
10. SR77, US6, Spanish Fork: Mainline segements LOS D in 2030, transitions LOS D in 2020.

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REGIONAL MOBILITY - VISSM

Evaluation Criteria Level of improvement of the interchange operations using the results from the VISSIM models as listed below:

- Delay
- Speed
- Density
- Travel time index
- Queuing

Edit Facts

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[From required regional mobility narrative, interchanges]:

1. Confirmed interchange design concepts met LOS D for all movements at ramp terminal intersections and adjacent interchanges.
2. University Parkway design provides LOS D for 2030, not just 2020.
3. American Fork to American Fork 500 and Pleasant Grove: 85% of the movements will operate at LOS C or better. At adjacent intersections, improvements significantly below 55 sec/vehicle requirement.
4. University Parkway area: All ramp terminals operate at LOS D or better in 2030. Requirements exceeded for University Parkway and Orem 800. At adjacent intersections, improvements significantly below 55 sec/veh requirement. University Parkway @ Sandhill intersection LOS C in 2030. Density in weaving sections on University Parkway 40% lower in 2030 than 2008 due to DDI and grade separations. Express Lane direct connect ramps eliminate

Edit Significant Strengths

Northern Terminus - Lehi Main Street

1. The increased spacing of signalized intersections associated with the SPUI, along with the reducing of number of intersections along Main Street will provide significantly better operations in a currently congested area.
2. 2030 LOS D or better exceeds the contract requirements.

Orem University Parkway

- LOS D or better is met for 2030, not just 2020 - exceeding contract requirements. Furthermore,

Minor Strengths

Northern Terminus - Lehi Main Street

- The travel time to/from I-15 are relatively good compared to freeflow travel for 2020.

Orem 800 North

- Proposal included a signalized intersection at 1500 West/800 North, which is an additional infrastructure improvement.

Minor Weaknesses

Northern Terminus - Lehi Main Street

- The modeled vehicles didn't stop for left turns off of Main Street to NB and SB I-15. The volumes are relatively light. This should have a minor impact on the LOS for these two movements due to low volume movements.

Orem University Parkway

- This concept will require

Significant Weaknesses

weaving problems on I-15; 10,000 vehicles use these ramps, eliminating this traffic from University Parkway, Orem Center, and Orem 800N.

5. Provo interchanges (Center Street and University Avenue): All ramp terminals operate at LOS D in 2030. Split diamond delay 7 to 10 sec/veh during 2030 AM and PM.
6. SR 77, US6, Spanish Fork: Serves 2030 travel demand in area. LOS C at intersections. Accommodates all queues, acknowledge important concern in Spanish Fork.

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All VISSIM file observations

1. Express Lane & GP lane volumes differ from the contract volumes. However, the two volume inputs together equal the total volume input from the documents.
2. 2% RV requirement is only applied to I-15 traffic. The arterial system doesn't include the 2% RV input.

Northern Terminus - Lehi Main Street (Proposed - SPUI)

1. Design vs. model observations
    1. HOV access points NB in model don't match the design drawings. Model has larger access points.
    2. Design has only one left turn lane EB & WB onto I-15. Model has dual left turn lanes.
    3. NB terminus striping in design files is one more lane than the modeling files.
    4. The SB merge from AF Main in the design differs from the modeling files.
        1. Design
            1. First lane drop accel lane = 1300 ft
            2. Second lane drop accel lane = 1600 ft
        2. Model
            1. First lane drop accel lane = 1530 ft
            2. Second lane drop accel lane = 1200 ft
2. Requirements not met
    1. Left turns from Lehi Main to NB & SB I-15 don't stop at the ramp terminal signals.
3. AM peak hour MOEs (Year 2020)
    1. Intersection LOS C or better. Projected to LOS D in 2030.
        1. Ramp terminal movements: 8 of 10
        2. Intersections: 2 of 3
    2. Travel time
        1. NB-EB = 83 Seconds
        2. NB-WB = 133 Seconds
    3. Travel time index = 1.12 (not provided by proposer)
4. PM peak hour MOEs (Year 2020)
    1. Intersection LOS C or better. Projected to LOS D in 2030.
        1. Ramp terminal movements: 6 of 10
        2. Intersections: 1 of 3
    2. Travel time
        1. NB-EB = 87 Seconds
        2. NB-WB = 142 Seconds
    3. Travel time index = 1.08 (not provided by proposer)

American Fork 500 East (Proposed - DDI)

1. Design vs. model observations
    1. The NB on-ramp at 500 East
        1. Design = 800-1000 ft
        2. Model = 1200 ft
2. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 12 of 12
        2. Intersections: 4 of 4
    2. Travel time
        1. SB I-15 to SB 500 E = 105 seconds
        2. SB I-15 to NB 500 E = 168 seconds
        3. NB I-15 to NB 500 E = 83 Seconds
        4. NB I-15 to SB 500 E = 131 Seconds

the modeling of this solution did not take into account the diversions expected to occur due to the HOV interchange. Therefore, volumes used for the analysis are conservative (higher) than expected.

- By creating grade separations for the westbound University Parkway to northbound I-15, and for the Northbound I-15 to the UVU campus, the intersection at Sandhill operates well beyond our contract requirements.
- This improvement has a direct positive impact on the interchange area by reducing overall congestion along University Parkway.
- Cross-section at grade along University Parkway provides one more lane in each direction which provide additional capacity between 400 West and the interchange.
- 5 lane cross-section EB over I-15.
- Direct access from UVU to I-15 helps traffic operations along University Parkway.

Provo Center Street

The split diamond solution provides for LOS C or better conditions in 2030. The signal control will allow the Department flexibility in addressing variations in traffic demand. The intersections associated with this design all operate at LOS B or better.

Orem 400 North Express Lane interchange

- From a traffic operations standpoint this option provides benefits by:
    - reducing weaving from the Express Lanes across all of the GP lanes to exit the freeway at standard interchanges.
    - Reduce the demand volumes at the adjacent interchanges with 800 North and Center Street.
    - Additional access for emergency services.

Orem 1500 South Express Lane Interchange

- From a traffic standpoint this option provides benefits by:
    - reducing weaving from the Express Lanes across all of the GP lanes to exit the freeway at standard interchanges.
    - Reduce the demand volumes at the adjacent interchanges with University Parkway.
    - Improvement of operations

US6/Spanish Fork

- Acomodates 2030 traffic demands
- Free flow movement from I-15 to US-6.
- Braided ramps from NB I-15 to US-6 and from NB Main Street to NB I-15, eliminating weaves.
- Closure of frontage road (Industrial Park Dr) at Spanish Fork Main improving access management.
- Loop ramp from US-6 to SB I-15 provides adequate acceleration lengths, eliminating a current weaving section with differential speed problems.
- NB Braided Ramps - Grade separation at Main for NB US-6 allows for free flow of traffic

mitigation techniques to account for the unfamiliarity with the DDI design and the proper alignment of movements. Both of these elements of DDI design impact operations as drivers reduce speeds to less than optimal to navigate the unfamiliar movements.

Provo Center Street

- Requires e/w traffic to traverse 3 traffic signals
- Some weaving will be introduced on the east and west sides of the split

3. Travel time index = 1.09

3. PM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 11 of 12
        2. Intersections: 4 of 4
    2. Travel time
        1. SB I-15 to SB 500 E = 116 seconds
        2. SB I-15 to NB 500 E = 216 seconds
        3. NB I-15 to NB 500 E = 96 Seconds
        4. NB I-15 to SB 500 E = 186 Seconds
    3. Travel time index = 1.13

Orem 1600 North (Diamond from preliminary design - VISSIM not required, but supplied as part of the Orem section)

1. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 16 of 19
        2. Intersections: 5 of 5
    2. Travel time index = 1.22
2. PM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 13 of 19
        2. Intersections: 4 of 5
    2. Travel time (not collected)
    3. Travel time index = 1.33

Orem 800 North (Proposed tight diamond)

1. Interesting facts
    1. A new signalized intersection at 1500 West included in 2030 models.
2. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 12 of 12
        2. Intersections: 4 of 4
    2. Travel time index = 1.22
3. PM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 8 of 12
        2. Intersections: 3 of 5
    2. Travel time index = 1.33

Orem 400 North (Proposed Express Lane Access)

1. No VISSIM analysis included.
2. Synchro files where provided.
3. New TDM volumes that have not been verified.

Orem Center Street (Proposed tight diamond)

1. Interesting observations
    1. AM peak model demonstrates tight weaving section between SB off-ramp to SB 1300 West.
    2. PM peak model shows congestion between NB ramp and 1200 West due to intersection spacing.
2. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 10 of 12
        2. Intersections: 4 of 4
    2. Travel time index = 1.22

3. PM peak hour MOEs (Year 2030)

    1. Intersection LOS C or better
        1. Ramp terminal movements: 8 of 12

2. Intersections: 3 of 4
2. Travel time index = 1.33

Orem University Parkway (Proposed DDI with grade separation WB over Sandhill Road)

1. Design vs. model
    1. No discrepancies
    2. SB On-ramp lane drop
        1. Design = 1050 ft
        2. Model = 1350 ft
2. Year 2030 analysis not 2020
3. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 10 of 12
        2. Intersections: 5 of 5
    2. Travel time
        1. SB-WB = 142 seconds
        2. SB-EB = 150 seconds
        3. NB-EB = 119 Seconds
        4. NB-WB = 142 Seconds
    3. Travel time index = 1.22
4. PM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 11 of 12
        2. Intersections: 5 of 5
    2. Travel time
        1. SB-WB = 167 seconds
        2. SB-EB = 143 seconds
        3. NB-EB = 146 Seconds
        4. NB-WB = 177 Seconds
    3. Travel time index = 1.33

Orem 1500 South (Proposed Express Lane access)

1. No VISSIM analysis included.
2. Synchro files where provided.
3. New TDM volumes that have not been verified.

Provo Center Street (Proposed split diamond)

1. Design vs. model observations
    1. 900 West Center
        1. Design
            1. EB=1 left turn, 2 through and 1 right turn 'trap'
        2. Model
            1. EB=1 left turn, 3 through with a shared right turn
    2. 1600 West Center
        1. Design
            1. WB=1 left turn 'trap', 1 through and 1 right turn 'trap'
        2. Model
            1. WB=1 left turn, 2 through with a shared right turn
2. The Split Diamond concept requires vehicles to pass through 3 signalized intersections for all E/W movements. -JTC-
3. AM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better
        1. Ramp terminal movements: 20 of 22
        2. Intersections: 7 of 7
    2. Travel time
        1. SB-WB = 68 seconds
        2. SB-EB = 147 seconds
        3. NB-EB = 97 Seconds
        4. NB-WB = 119 Seconds
    3. Travel time index = 1.11
4. PM peak hour MOEs (Year 2030)
    1. Intersection LOS C or better

1. Ramp terminal movements: 21 of 22
2. Intersections: 6 of 7

2. Travel time
   1. SB-WB = 75 seconds
   2. SB-EB = 156 seconds
   3. NB-EB = 101 seconds
   4. NB-WB = 123 seconds
3. Travel time index = 1.19

US-6/Spanish Fork Main Street (Proposed reconfiguration: 3 SB lanes to US-6, improved loop ramp from US-6 to SB I-15 over SF Main St., braided NB ramps)

1. Design vs. model observations
   1. SB CD-ramp from SF Main
      1. Design = 390 ft south of Main
      2. Model = 490 ft south of Main
   2. SB CD-ramp where SF Main ties with US-6 - 2 lane cross-section
      1. Design = 525 ft
      2. Model = 340 ft
   3. SB merge from Main/US-6 merge
      1. Design = 650 ft with another lane drop at 950 ft
      2. Model = one accel lane at 1040 ft
2. The NB CD from Main Street has some minor merging issues where it goes from two lanes to one lane prior to the US-6 merge.
3. AM peak hour MOEs (Year 2030)
   1. Intersection LOS C or better
      1. Ramp terminal movements: 11 of 12
      2. Intersections: 3 of 4
   2. Travel time index = 1.18
4. PM peak hour MOEs (Year 2030)
   1. Intersection LOS C or better
      1. Ramp terminal movements: 8 of 12
      2. Intersections: 4 of 4
   2. Travel time index = 1.19

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MEDIUM - FSZ

OTHER OPERATIONAL IMPROVEMENTS

Evaluation Criteria – Other operational improvements including the following:

o Number and nature of decision points
o Length of weave areas
o Width and location of shoulders and refuge areas
o Number of bicycle/pedestrian conflicts with traffic o Provision of clear zones

Edit Facts

Operation Characteristics Collected:

- Number of lane changes required for movements
- Bicycle conflicts
- Ped conflicts
- Weave for ramps to mainline
- Grade separated bike/ped facilities
- Locations of non-continuous GP lanes
- Substandard Shoulders
- Non-Standard taper rates
- Full clearzone provided, length

PLEASE SEE ATTACHED FILE FOR THIS INFORMATION

Additional Information:

Edit Significant Strengths

- New Provo 500 W grade separation crossing reconnects Provo communities and fulfills EIS commitment
- Permanent improvements to Geneva Road between University Parkway and Lindon 200S provided during MOT phases of I-15, will provide permanent operational benefits to I-15 mainline operations
  - Includes 7 lane bridge over the RR (no follow-on Geneva Rd project required)
  - Scab widening of pavement along existing Geneva will provide a 5 lane roadway section from University Parkway to Lindon 200 S

Minor Strengths

- Replacement of Hobble Creek box culvert provides capacity for 100 yr flood and will provide new habitat for the June Sucker through a formal consultation with the participating agencies.
- At Provo Center Street the signalized right angle pedestrian crossings improve visibility and safety for pedestrians.
- At Orem Center Street and 800 North Orem the tight diamond interchange increases pedestrian and bicycle safety by allowing for a /bicycle pedestrian phase in the signalizd ramp terminals, and by providng a continuous bike lane along the edge of the street. There are fewer pedestrian/ traffic conflicts than would be present at a SPUI.
- The short, direct walking distance through the tunnel to cross University Parkway at Sandhill

Minor Weaknesses

- University Parkway WB to I-15 NB on-ramp free flow right has an at-grade pedestrian crossing after the grade separated crossing at Sandhill Road

Significant Weaknesses

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Traffic Group Input:

1. The proposal does not contain weaving areas, as defined by the Highway Capacity Manual.

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Road improves safety by decreasing the chance that pedestrians will attempt to cross at grade.

NUMBER OF INTERSECTIONS

Evaluation Criteria – Number of intersections improved and level of improvement.

Edit Facts

Improvements to Intersections:

39 Intersections were improved:

- 44 thru lanes
- 19 left turn lanes
- 12 right turn lanes
- 12 acceleration lanes
- 17 medians
- 19 shoulders
- 26 sidewalks
- 25 improved pedestrian safety
- 25 improved ped access
- 25 improved bike safety

SEE ATTACHED MAPS FOR MORE SPECIFICS REGARDING EACH INTERSECTION

Additional Comments:

Edit Significant Strengths

- The intersections provided in the proposal consistenly contained logical and smooth transitions to the existing roadway network.
- Improved 26 additional intersections by adding additional permanent turn lanes, thru lanes, acceleration lanes or shoulders, etc not required to meet LOS D with 2030 volumes:
  - Lindon 400 North and Proctor Lane
  - Lindon 200 South and Geneva Road
  - Orem 1600 North and Geneva Road
  - Orem 800 North and 1500 West
  - Orem 400 North and Geneva Road
  - Orem Center Street and Geneva Road
  - Orem 400 South and Geneva Road
  - University Pkwy and College Drive
  - Provo 500 West and frontage roads on each side of I-15
- Improved US 6 and Chappel Drive intersection, added double left WB & EB and carried 3 EB thru intersection. Double left will improve movement from US 6 to Spanish fork Main Street movement and access that is not possible through the I/C's.
- Proposed street construction under the bridge at Provo 500 W will accomodate the truning movements to and from the frontage road on the west side of I-15
- The intersection of Sandhill Road and Univ Pkwy includes:
  - 4 EB thru lanes and an additional lane on the EB flyover
  - 4 WB thru lanes

Minor Strengths

- Provo Center Street -3 EB thru carried through 1000 W
- Signalized "T" I/S with Independence Ave and Provo Center Street is consistent with driver expectations and provides good access to local street network
- Orem Center Street -3EB through carried through 1200 W
- Provided additional trun lanes at the express lane connection at 400 N & 1200 W
- 1600 N added thru and RT turnes at Lindon Parkway

Minor Weaknesses

Significant Weaknesses

Structures

Evaluation Criteria – Extent of bridge improvements including:

o Number of structurally deficient and/or functionally obsolete structures replaced
o Number of structures rehabilitated and/or widened
o Maintenance cost and ease of re-decking, inspection and maintenance for each structure type

Edit Facts

From Data Miners:

- Replaced Bridges - 54
- New Bridges - 8
- Widened Bridges - 0
- Rehabilitated Bridges - 0
- Drainage Structures Replaced - 6 major drainage crossing structures
- Drainage Structures Widened - 2 (east bay and spring creek)

Out of the 54 replaced:

Edit Significant Strengths

- Reconstructing Lehi Main St. Interchange. Will provide brand new structure based on latest seismic criteria.
- Reconstructing US-6 interchange. Replacing all existing structures and adding one new structure for I-15 N/B to US-6 E/B over SF Main.
- Replacing 54 existing bridges.

Minor Strengths

- Maximizing the use of single span bridges reduces long-term maintanence costs and these bridges are more predictable during a seismic event.
- Included "Smart Bridge Technology" on three bridges.
- All bridges will be new construction; they are not rehabilitating or widening any bridges.
- Use of partial depth deck panels increases worker and public safety during contruction.
- Providing new bridge at 500W in Provo.
- Providing new bridge on Geneva Road over UPRR at 400S that provides UDOT with a new grade separated RR crossing.

Minor Weaknesses

Significant Weaknesses

evaluator

Consensus Form

- 14 were Functionally Obsolete
- 5 were Structurally Deficient

SEE ATTACHED SPREADSHEEET FOR MORE DETAILED INFORMATION

Additional Information:

(LRR) Adding the Geneva Road 400 S RR Bridge
(LRR) All bridges standard beam and girder, redecking feasible.
(LRR) Maximized use of single span bridges.
(FKD) Using pre-cast substructural elements (footings,column, bent cap) at some locations.
(MAD) Extensive use of semi-integral abutments.
(MAD) Steel and PC/PS Girder Types.

- They have 54 existing bridges being replaced and 8 new bridges. Only 3 out of 62 bridges utilize steel girders. Therefore, 95% of the combined new and existing bridges are concrete superstructures which have the least long-term maintenance costs/requirements.

Pavement

Evaluation Criteria – Anticipated pavement performance for each pavement type based on design output and evaluations of:

o Location and extent of each type of pavement and pavement section, including surface treatments
o Design Life o Life cycle costs

Edit	Facts	Edit	Significant Strengths	Minor Strengths	Minor Weaknesses	Significant Weaknesses	evaluator
	Pavement Quantities: Mainline: • 30 year Rigid: 342.33 lane miles • 20 year Flexible: 2.64 lane miles Ramps: • 30 year Rigid: 48.90 lane miles Cross Street Pavement: • 20 year Flexible: 65.53 lane miles **SEE ATTACHED FILE FOR MORE DETAILED INFORMATION (on above items)** Additional information: • Mainline pavement section consists of: o 13 inches PCCP o 4 - 6 inches UTBC or OGB o 11 - 13 inches GB		• FSZ is proposing 30 year PCCP from Lehi Main Street to Spanish Fork Main Street (mainline, shoulders, and ramps). • The proposal exceeds the requirements for design life south of Provo Center Street by 10 years.	• Shoulders will be constructed full width complete with load-transfer dowel bars. o This will add value for potential future widenings where shoulders can be readily incorporated as travel lanes. • Cross road pavements that are constructed on native clays will include a sub-grade geotextile. This will prevent the migration of fines up into the subgrade.	• FSZ is using a CBR value of 15 for all subgrade under PCCP on Mainline I-15 with existing embankment. Typically a CBR value of 10 is the maximum used for subgrade in design, in part to account for inconsistencies in materials and construction processes. • FSZ does not provide any comittment to drainage systems, but rather states that it will be addressed on an "as need" basis. • Although FSZ has committed to address in final design, in cooperaton with the Department, specifics of materials as they apply to structural quality and drainage, they have yet to commit to a specific pavement section and complete design inputs.		Consensus Form

LOW - FSZ

INTERIM FUNCTIONALITY

Evaluation Criteria – For areas between American Fork Main Street and Provo Center Street that will be constructed to less than full build out of the UIC:

o Level of interim functionality
o Amount of rework costs and traffic impacts required to complete full build-out,
o 2020 and 2030 LOS
o The associated year that the LOS crosses the D/E threshold

Edit	Facts	Edit	Significant Strengths	Minor Strengths	Minor Weaknesses	Significant Weaknesses

- The proposer provides the full UIC buildout.

CROSS STREET OPERATIONAL METRICS

Evaluation Criteria – Operational metrics in cross street transitions to existing facilities

Edit Facts

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Traffic Group Input:

1. See attached spreadsheet for detailed analysis of cross street transitions.

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Edit Significant Strengths

Minor Strengths

- Lehi Main Street widened in conjunction with the bridge replacement and interchange improvements.
- Orem 1600N, West Side: Full build to Geneva
- Orem 800N West Side: Carrying 3 lanes thru the intersection provides additional capacity
- Orem 800N East Side: Carrying 3 lanes thru the intersection provides additional capacity
- Orem Center Street, West Side: Carrying two lanes thru 1330 W provides more space for merging and weaving
- Orem Center Street, East Side: Carrying three lanes thru 1200 W provides additional length for merging and weaving
- University Parkway, East Side: Grade separation of WB to NB movement simplifies transition
- The transition between the existing 2700 North (2 lanes) and the Proposed 2700 North (2 lanes) is smooth
- US6 and Chappel Dr, East Side: Carrying 3 lanes thru the intersection provides additional capacity

Minor Weaknesses

- Provo Center Street, East Side: Cul de sac 1100W (not included in the FEIS) will need process approvals

Significant Weaknesses

NON-MOTORIZED IMPROVEMENTS

Evaluation Criteria – Extent and functionality of non-motorized improvements.

Edit Facts

Non Motorized Improvements:

1. 23.7 miles Fiber Backbone
2. 15 signalized intersections
3. 1 pedestrian separated crossing
4. 63,600 feet bike lane (could be striped or not striped)
5. 5400 feet regional trails
6. 45,200 feet sidewalk

FOR MORE DETAILED INFORMATION SEE ATTACHED FILE

Edit Significant Strengths

Minor Strengths

- @ Spanish Fork Main Street, pedestrian access across I-15 is provided on both sides of Spanish Fork Main Street.
- New Park and Ride Lot at Orem 1500 South with Express Lane Direct Access Connection
- Provo 500W grade separaton provides pedestrian access across I-15
- Reconstruction of Spanish Fork 2700N provides a connection for regional multi-use trail

Minor Weaknesses

Significant Weaknesses

BEYOND DESIGN YEAR

Evaluation Criteria – Potential performance beyond the design year; reserve capacity and/or ease of future improvement.

Edit Facts

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Traffic Group Input:

Reserve Capacity

1. 2.5% projected annual growth along corridor.
2. Full buildout of UIC provides excess capacity beyond 2030.
3. 42/50 mainline segments operate at LOS C or better in the AM. (Core calculated HCS+)

Edit Significant Strengths

- This proposer's commitment to the University Parkway/Sandhill interchange area provides capacity to 2030, 10 years beyond the 2020 requirement.
- This proposer's commitment to the Lehi Main Street/Northern Terminus area provides capacity in the transition area to 2030, 10 years beyond the 2020 requirement.
- Express lane direct connect I/C's draw traffic away from University Parkway I/C, Orem 800N I/C and Orem Center Street I/C and extends operational life of interchanges and mainline. [Note: I/C's where designed and evaluated with Contract traffic volumes;

Minor Strengths

- This proposer's commitment to the Southern Terminus area provides capacity to 2030, 10 years beyond the 2020 requirement.
- 42/50 segments LOS C in the AM.
- 33/50 segments LOS C in the PM.
- 7 years reserve capacity in

Minor Weaknesses

Significant Weaknesses

4. 33/50 mainline segments operate at LOS C or better in the PM. (Core calculated HCS+)
5. Approximately 7 additional years of southbound reserve capacity from500 E to PG Blvd, 1600 N to Provo Center St, between University Avenue ramps, between SR-75 ramps, and south of SF Main to terminus.
6. Approximately 7 additional years of northbound reserve capacity from the off-ramp to SF Main to the on-ramp from US-6, University Ave to Provo Center St., University Pkwy to Orem 1600 N off ramp, Orem 1600 N on ramp to PG Blvd off ramp, and PG Blvd on ramp to 500 E off ramp.

volumes were not adjusted to account for impact of adding the direct access I/C's]

some southbound and northbound segments.
- There is significant reserve capacity in the Provo Center Street I/C concept
- Dowel bars in shoulders facilitates future widening

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MAINTENANCE

Evaluation Criteria – Assessment of long term maintenance and operating costs related to the following: Snow removal and storage; Power consumption; Need for specialized maintenance equipment; Drainage system maintenance.

Edit Facts

From Data Miners:

- 341.96 lane miles of mainline pavement
- 48.90 lane miles of ramp pavement
- 65.53 lane miles of cross street pavement

Additional Information:

- None

Edit Significant Strengths Minor Strengths

- Provided 54" concrete median barrier all the way to just south of SF 300 W. Provided continuous 42" roadside barrier to just south of University Ave. South of University Avenue provided intermittent 42" concrete roadside primarily at approaches to structures.
- Use of PCCP on all ramps will simplify future roadway maintenance
- 59 of 62 bridges have concrete girders which have low long term maintenance costs.

Minor Weaknesses Significant Weaknesses